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is only possible to a limited extent; and the enlightened efforts of the expert may end in aggravating the blunders of the enumerator. His own opinion or prejudice may come in, and so warp the poor facts already twisted out of shape by the clumsy reporter of them, that they finally bear no likeness to the situation they ought to portray. A permanent statistical bureau, collecting its facts from year to year, and correcting the mistakes of one year by the better information of the next, is far less likely to err in this respect than an organization which works, like our national census bureau, only at intervals of ten years. Though the latter may, and of late years does, extend its labors well over the whole period from one ten-years' point to another, it still lacks the useful correction which annual returns inevitably supply.

All things considered, the eight volumes before us are excellent, and indicate that the whole series, when completed, will far surpass, not only the work of any previous decade in this country, but the published results of any similar census in the world. The plan of President Walker was an ambitious one, his selection of experts and subordinates was mainly good, and the time allowed for them to complete their tasks has been ample. Unfortunately, the cost of so great an enterprise was not well understood; and the needful appropriations of money have not been made, or have been so delayed as to impede the work. The undertaking also suffered from its own vastness, and much of that which was hoped for was found unattainable. The important subject of pauperism, for example, — the correlative to our unexampled growth in material wealth, — receives inadequate treatment in the 'Compendium,' and cannot be so exhibited in the quarto volume as to do it justice. Mr. Wines, who has charge of this topic, has given up in despair the effort to collect statistics of out-door relief, and only reports on the almshouse expenditure, and number of inmates. This is, in fact, to omit more than half the material belonging to the subject, and that portion, too, which best exhibits the growth of pauperism from year to year. In other divisions of the work a similar class of omissions may occur, in consequence of which the results will appear in some respects more defective than those of the last census. But in fact, and on the whole, they are much more complete; and the volumes now issued, with those which are to appear, will furnish material to economic and scientific students for years to come. The more they use them, the better will they appreciate

the foresight, labor, and research of the men who compiled them, although they will also perceive more clearly how defective the most perfect statistics are foreordained to be.

GEOLOGY OF THE SUSQUEHANNA RIVER REGION.

Second geological survey of Pennsylvania: report of progress Gⁱ. The geology of the Susquehanna River region in the six counties of Wyoming, Lackawanna, Luzerne, Columbia, Montour, and Northumberland. By I. C. WHITE. With a colored geological map in two sheets, and 31 page plates in the text. Harrisburg, 1883. 30 + 464 p. 8°.

THE region to which this report relates embraces nearly two thousand square miles of the Devonian and Silurian rocks lying north and west of the great anthracite-coal basins, along the north branch of the Susquehanna River. Although there are some small outliers of the true coal-measures in this district, Professor White has referred to these only incidentally; his report beginning at the base of the Pottsville conglomerate (millstone grit) No. xii., and extending down to the oldest formation exposed, which is the Medina No. iv.

The volume begins with a long prefatory letter by Professor Lesley, director of the survey. This is essentially a somewhat critical summary of the more interesting features of Professor White's report, which embraces two distinct portions; the first third of the volume being a comprehensive account of the geology of the entire district, and comprising nearly every thing of general interest, while the remainder of the work is devoted to a detailed report by townships on each of the six counties.

A brief account of the drainage and topography is followed by a description of the interesting glacial phenomena. The great terminal moraine crosses Carbon, Luzerne, and Columbia counties in a general north-westerly direction, dividing the region into a north-east glaciated portion and a south-west unglaciated portion. Back of the moraine is the mantle of unmodified drift, derived entirely from the local rocks. In front of the moraine, or to the south and west, the whole country is covered, up to a height of seven hundred and fifty to eight hundred feet above tide, with a stratified deposit of modified drift. According to Professor White, this deposit was spread by the gigantic rivers resulting from the melting of the ice-sheet; but Professor Lesley finds it necessary to suppose a subsidence of the land,

that permitted the sea to wash the terminal moraine, and cover all points less than eight hundred or a thousand feet above tide. Out of the modified and unmodified drift the modern rivers have carved their channels, leaving a series of well-marked terraces, the highest of which are now two hundred feet above the streams.

But in the northern or Wilkes-Barre coal-basin, the Susquehanna and its tributaries are still fifty to a hundred and eighty-five feet above their pre-glacial beds for a distance of at least twenty-five miles; and these buried valleys are of unusual interest, because at Bloomsburg, Sunbury, and Selinsgrove, points on the Susquehanna thirty to seventy miles below Wilkes-Barre, the rocky bed of the river is a hundred and ten, ninety, and seventy feet respectively higher than the buried channel at Wilkes-Barre.

The geological structure of this district is typically Appalachian, a north-west and south-east section including ten principal overlapping flexures of the strata, and the synclinals holding the anthracite-coal fields.

Professor White believes there is a transition series between the Pocono sandstone No. x. and the Catskill No. ix., and another between the Catskill and the Chemung No. viii.

The paleontology of this report presents several striking anomalies; various Devonian and Silurian types, including some of those regarded as most characteristic of their respective horizons, occurring here in associations, and following each other vertically, in an order unknown elsewhere. Professor Lesley suggests that this apparent confusion may be due, in part, to incorrect determinations of the forms. But some of the confusion is real; for *Halysites catenulata*, a coral which no one could mistake, occurs very abundantly at one locality in the Stormville limestone, which belongs near the middle of the lower Helderberg, although this form was never before found above the Niagara.

Like most of the Pennsylvania reports, this volume is abundantly indexed; there being six different indexes, covering fifty-four pages.

NOTES AND NEWS.

A SHORT time since, we referred to the call of the Peabody museum of American archaeology for funds to enable the museum to continue its important and thorough explorations in Ohio. So far the work has been continued without interruption, thanks to the persons whose subscriptions are here acknowledged: Mr. John C. Phillips, Boston, \$200; Hon. Stephen

Salisbury, Worcester, \$100; Hon. Robert C. Winthrop, Boston, \$50; Mr. H. A. Homes, Albany, N.Y., \$5; Mr. A. H. Thompson, Topeka, Kan., \$5; Mr. A. E. Douglass, New York, N.Y., \$47; Mr. William B. Weedon, Providence, R.I., \$50; Mrs. Esther Herrman, New York, N.Y., \$50: total, \$507.

— The French association for the advancement of science has appointed two delegates to attend the Philadelphia meeting of the American association, — Professor Joubert, professor of physics, and general secretary of the French society of physics; Professor Silva, professor of chemistry at the Municipal school of physics and industrial chemistry. This is of interest as promoting the formation of an international association.

— Before the section of economic science and statistics of the American association, papers are announced on the following subjects: A study of cotton fibres, their value, etc., illustrated by photo-micrographs; The economics in deaf-mute instruction; Explanation of instruments used to determine the power to move trains, and also of instruments for the inspection of railroad-tracks; The apprenticeship question and industrial schools; The value of photo-micrographs of wood-fibres, illustrated with sections of thirty different woods; The use of graphics in statistics; Exhibitions, national and international, considered as economic forces; Theory and economy of the American system of patents; The allotment of lands to Indians, illustrated by experience with the Omaha tribes; The public and the professions, 1870–80; Statistics and organization of the classified public service in the United States; Some general results of the census of crime and misfortune in the United States; The economic element in the problem of manual training. (Several papers are expected on important topics.)

— We are informed by a private letter that three of the younger mathematicians of Germany, all men of mark, are expecting to attend the meeting of the British association in Montreal, and are planning afterwards to visit the United States. Reference is made to Messrs. Lindemann of Königsberg, Dyck of Munich, and Wedekind of Carlsruhe, all of them professors ordinarii in their respective places.

— *Nature* states, that, at the request of the council of the British association, Admiral Sir Erasmus Ommanney, C.B., F.R.S., has consented to act as treasurer during the meeting at Montreal, Canada. It further announces that Prof. W. G. Adams of King's college will be unable to give the Friday evening lecture at Montreal, and that Prof. O. J. Lodge will take his place. The subject of Professor Lodge's lecture will be 'Dust.'

— The Seth Thomas clock-company has undertaken, under the advice and guidance of Dr. L. Waldo, the construction of clocks of a high grade of excellence for scientific purposes, which they propose to call clocks of precision. They have already made considerable progress as to the best form of pendulum suspension, and dimensions of the steel-jar mercurial pendulum (which is filled *in vacuo* by a new